

TITLE OF THE INVENTION

REFRIGERATOR

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of Korean Application No. 2003-29427, filed May 9, 2003, in the Korean Intellectual Property Office, the disclosure of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present invention relates to a refrigerator, and more particularly to a refrigerator maintaining a uniform temperature distribution throughout a storing compartment of a main body by continuously circulating and supplying a cool air to the storing compartment.

Description of the Related Art

[0003] Conventionally, a refrigerator is provided with a cool air duct which is formed with a cool air inflow hole and a cool air outflow hole communicating with storing compartments in order to continuously supply and circulate a cool air in the storing compartments.

[0004] As shown in FIG. 1, a conventional refrigerator has a main body 2 formed with a storing compartment 1; a cool air duct 4 is provided in a rear side of the main body 2 and supplies cool air into the storing compartment 1; and a door 6 in a front of the main body 2, opens and closes to provide access to the storing compartment 1.

[0005] According to the conventional refrigerator as described above, cool air flows out from the rear of the storing compartment 1 through the cool air duct 4 provided in the storing compartment 1 of the main body 2, which cause a temperature difference between the front and the rear of the storing compartment 1. Therefore, uniform temperature distribution cannot be maintained and cooling efficiency is lowered. Particularly, when the door is opened and closed,

the temperature difference of between the front and the rear of the storing compartment 1 increases significantly.

[0006] Recently, to solve the problems described above, a configuration of a cool air duct allowing cool air to flow out toward a front of a storing compartment has been developed, but the installation structure is complicated and a separate space is required to install the cool air duct. Consequently, problems relating to cost and space usage efficiency are generated.

SUMMARY OF THE INVENTION

[0007] It is an aspect of the present invention to provide a refrigerator maintaining the uniform temperature distribution of a storing compartment of a main body and increasing space usage efficiency.

[0008] Additional aspects and/or advantages of the invention will be set forth in part in the description that follows, and, in part, will be obvious from the description, or may be learned by practice of the invention.

[0009] To achieve the above and/or other aspects according to an embodiment of the present invention, there is provided a refrigerator having a main body formed with a storing compartment. A first cool air duct is provided in a rear of the main body, a lamp unit is mounted in an upper part of the main body and has a lamp and a lamp case and a second cool air duct is formed in an upper part of the lamp case to communicate with the first cool air duct to allow cool air to flow flowing through the first cool air duct to flow out toward a front of the storing compartment of the main body.

[0010] According to an aspect of the invention, the second cool air duct is formed in the lamp case as one body.

[0011] According to an aspect of the invention, the second cool air duct is detachably formed in the lamp case.

[0012] According to an aspect of the invention, an insulating member is provided in the second cool air duct to prevent dewdrops from generating in an outside of the lamp case by heat exchange of the lamp and the second cool air duct.

[0013] According to an aspect of the invention, the second cool air duct has an upper case and a lower case engaged to each other.

[0014] According to an aspect of the invention, the lower case includes an insulator to prevent the dewdrops from generating by heat exchange of the lamp and the lower case.

[0015] According to an aspect of the invention, the refrigerator further includes a cool air chamber formed in one side of the lamp case to communicate with the second cool air duct. This configuration allows the cool air flowing through the second cool air duct to flow out toward the front of the storing compartment of the main body.

[0016] According to an aspect of the invention, the refrigerator a cool air distributing member is provided in a cool air outflow hole of the cool air chamber and allows the cool air flowing out toward the front of the storing compartment of the main body through the second cool air duct to be dispersed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] These and/or other objects and advantages of the present invention will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompany drawings, of which:

FIG. 1 is a partially sectional view illustrating a configuration of a cool air duct of a conventional refrigerator;

FIG. 2 is a partially sectional view illustrating a configuration of a cool air duct of a refrigerator according to an embodiment of the present invention;

FIG. 3 is an exploded perspective view illustrating engagement of a lamp unit and the cool air duct of the refrigerator according to an embodiment of the present invention;

FIG. 4 is a perspective view illustrating engagement of the lamp unit and the cool air duct in FIG. 3; and

FIG. 5 is a sectional view illustrating flow of cool air, which flows through the cool air duct of the refrigerator according to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0018] Reference will now be made in detail to the embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to the like elements throughout. The embodiments are described below to explain the present invention by referring to the figures.

[0019] As shown in FIG. 2, a refrigerator according to an embodiment of the present invention includes a main body 20 formed with a storing compartment 22; a first cool air duct 30 provided in a rear of the main body 20; a lamp unit 40 which is mounted on an upper part of the main body 20 and provided with a lamp 42 and a lamp case 44; and a second cool air duct 50 which is formed in an upper part of the lamp case 44 to communicate with the first cool air duct 30 and allows a cool air flowing through the first cool air duct 30 to flow out toward a front of the storing compartment 22 of the main body 20.

[0020] In a front of the main body 20 is provided a door 90 which opens and closes a front opening of the storing compartment 22.

[0021] The first cool air duct 30 is formed with a cool air path, and supplies cool air undergoing heat exchange in an evaporator (not shown) to the storing compartment 22 in order to maintain the temperature distribution of the storing compartment 22 of the main body 20 uniformly. The shape and installation position of the first cool air duct 30 may be changed.

[0022] Because the second cool air duct 50 is provided to allow the cool air flowing through the first cool air duct 30 to flow out toward the front of the storing compartment 22, the second cool air duct 50 relatively promptly lowers the temperature of the front of the storing compartment 22, which is elevated by opening and closing of the door 90, to thereby maintain a uniform temperature distribution of the storing compartment 22.

[0023] The lamp unit 40 is turned on/off according to the opening and closing of the door 90 as a lighting device for the storing compartment 22 of the main body 20. A lower part of the lamp case 44 is engaged with a lamp cover 46.

[0024] The second cool air duct 50 and installation structure thereof is described with reference to FIGS. 3 through 5. As shown in FIGS. 3 through 5, the lamp case 44 according to

an embodiment of the present invention is provided with the second cool air duct 50 formed with a cool air path, a cool air outflow hole, and a cool air chamber 70 communicating with the storing compartment 22 of the main body 20.

[0025] The second cool air duct 50 is formed in an upper part of the lamp case 44 as one body or detachably formed in the upper part of the lamp case 440 and different methods to couple the second cool air duct 50 and the lamp case 44 may be used.

[0026] The second cool air duct 50 comprises an upper case 52 and a lower case 54 engaged to each other. An insulating member 60 is provided in the second cool air duct 50 to prevent dewdrops from generating in an outside of the lamp case 44 by heat exchange of the lamp 42 and the second cool air duct 50. The insulating member 60 has a shape to cover the lower case 54 of the second cool air duct 50. The dewdrops generated by the heat exchange of the lamp 42 and the lower case 54 of the second cool air duct 50 may be prevented by providing the lower case 54 as an insulator without using the insulating member 60. It is understood that the insulating member 60 may also be placed between the lower case 54, and the lamp case 44. Also, the second cool air duct 50 may be configured as one body as necessary.

[0027] The second cool air duct 50 is provided in an upper slope of the lamp case 44 to reduce a height difference between the second cool air duct 50 and the lamp case 44, to thereby relatively increase space usage efficiency. The shape and installation position of the second cool air duct 50 may be varied according to the applied lamp case 44.

[0028] The cool air chamber 70 is formed in one side of the lamp case 44 as one body to communicate with the second cool air duct 50 and allows the cool air flowing through the second cool air duct 50 to flow out toward the front of the storing compartment 22 of the main body 20. The cool air outflow hole of the cool air chamber 70 is provided with a cool air distributing member 80 which allows the cool air flowing out toward the front of the storing compartment 22 of the main body 20 to be uniformly dispersed.

[0029] Cool air may be dispersed into the storing compartment 22 of the main body 20, using various type members, such as an air shower type plate, applied to the cool air distributing member 80.

[0030] The lamp case 44 is engaged with the lamp cover 46. A cool air inflow hole 53 which communicates with the first cool air duct 30 is provided.

[0031] The cool air flow by the cool air duct described above is described as follows. The cool air undergoing the heat exchange in the evaporator (not shown) flows upward through the first cool air duct 30 provided in the rear of the main body 20. The cool air flows through the second cool air duct 50 provided in the lamp case 44 of lamp unit 40 and communicating with the first cool air duct 30.

[0032] The cool air flowing through the second cool air duct 50 flows out toward the front of the storing compartment 22 of the main body 20 via the cool air chamber 70 and the cool air distributing member 80.

[0033] As described above, according to an embodiment of the present invention, cool air is allowed to flow out toward the front of the storing compartment in which temperature is very frequently varied, so that uniform temperature distribution of a storing compartment of the main body is quickly restored and accordingly cooling efficiency of a refrigerator is improved.

[0034] Also, the second cool air duct is formed with the lamp unit as one body, so that space usage efficiency is relatively increased.

[0035] Although a few embodiments of the present invention have been shown and described, it will be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the principles and spirit of the invention, the scope of which is defined in the appended claims and their equivalents.